

XXXIX.—*Descriptions of some new American Phyllopod Crustacea.* By A. E. VERRILL*.

ARTEMIA, Leach.

THIS interesting genus is remarkable for its habit of living and flourishing best in very saline and alkaline waters, such as the natural salt lakes of Egypt, Utah, &c., and the artificial brines formed by the evaporation of sea-water by exposure to the heat of the sun, as in England, France, and the West Indies.

The species first made known, *A. salina*, Leach (*Cancer salinus*, Linn.), was first described by Schlosser†, who found it in great profusion in the brines of Lymington, England. Linné indicates it also from the salt lakes of Siberia—perhaps a distinct species, and probably the same as that observed by Pallas‡ in great numbers in the Great Schiméléc. More recently it has been described from the salterns of southern France, at Montpellier, &c.§ The genus has been found also in the lakes Goumphidieh, Amaruh, and Bédah in Egypt, which are reported to be both very saline and alkaline, their bottoms being “covered with a layer of crystals of carbonate of soda, sulphate of soda, and common salt,” while the density of the water is stated as 1.255. The Egyptian species appears not to have been described as yet||. In the Antilles *A. Guil-*

* From Silliman's American Journal, being an abstract of a paper read before the American Association for the Advancement of Science, Salem, Mass., Aug. 1869.

† ‘Observations périodiques sur la Physique, l'Histoire Naturelle et les Beaux-Arts,’ par Gautier, 1756 (with figures). An extract from this is republished in ‘Annales des Sciences Nat.’ sér. 2. t. xiii. p. 226 (1840), in an elaborate description of the anatomy, development, habits, &c. of *Artemia salina*, by M. Joly, illustrated by two excellent plates of the female and young. M. Joly failed to observe the male among more than a thousand females, and therefore doubted whether the sexes were distinct, suggesting that the males very well described by Schlosser were only the young, although that author described them as clasping the females in the well-known manner; but he did not observe the actual copulation.

See also an article by Thomas Rackett, in Trans. Linn. Soc. of London, 1812, vol. xi. p. 205, pl. 14 (figures very bad); Thomson, Zoological Researches, No. 5. p. 105, t. 1 & 2; W. Baird, Nat. Hist. of the British Entomostraca, p. 61, tab. 2. figs. 2-4 (figures very good, but the specimens probably not full-grown).

‡ Voyage en différentes provinces de l'Empire de Russie, t. ii. p. 505 (tr. Joly).

§ M. Payen, “Note sur des Animaux qui colorent en rouge les marais salans,” Ann. des Sci. Nat. 1836, sér. 2. t. vi. p. 219 (contains experiments on the effects caused by altering the composition and density of the water); also *op. cit.* 1838, t. x. p. 315; Joly, *op. cit.* 1840, t. xiii. p. 225 (see above); Milne-Edwards, Crustacés, t. iii. p. 369 (1840).

|| Audouin, Ann. des Sci. Nat. 1836, sér. 2. t. vi. p. 230.

dingi, Thompson, occurs*. *A. Mulhausenii*, Edw. (Fischer, sp.) is found in Lake Loak, in the Crimea†. A few years ago Prof. Silliman presented to the Museum of Yale College a number of specimens of a new species, *A. monica*, V., which he collected in Mono Lake, California, where it occurs in great abundance associated with the larvæ of *Ephydra*‡. The water of this lake is very dense, and not only very saline but also so alkaline that it is said to be used for removing grease from clothing. I have been unable, however, to find any reliable analysis of this water. It is said to contain biborate of soda. Prof. Silliman informs me that the genus also occurs in Little Salt Lake. It occurs in great abundance in Great Salt Lake, Utah, as I am informed by Prof. D. C. Eaton, who obtained specimens there during the present summer; but these have not yet come to hand. The water of Great Salt Lake has usually been described by travellers as destitute of all life; but according to Prof. Eaton it contains not only an abundance of *Artemie*, but also various other small animals, insect-larvæ, &c. The density of the water is stated as 1·170, but doubtless varies much according to the season§. It yields, according to Dr. Gale, over 22 per cent. of solid matter||, while the Syracuse Saline, one of the richest natural brines in the United States, contains but 19·16 per cent.¶ A few weeks ago, Mr. Oscar Harger discovered another new species, *A. gracilis*, V., near New Haven, under very peculiar circumstances. On the long wooden bridge across West River and the extensive salt-marsh on the West-Haven side, are placed large wooden tubs filled with water from various pools on the marsh, to be used in case of fire. By long exposure to the sun and air, the water in these becomes concentrated, and thus furnishes suitable stations for the rapid increase of *Artemie*. On examining the tubs on the

* Thompson, Zool. Researches, fasc. 7. pl. 1. figs. 11, 12.

† Edwards, Crustacés, t. iii. p. 370 (1840).

‡ Verrill, Proc. Boston Soc. Nat. Hist. 1866, vol. xi. p. 3 (the larvæ were wrongly referred to *Eristalis*); Packard, "On Insects inhabiting Salt-water," Proc. Essex Inst. 1869, vol. vi. p. 41.

§ The density of the water of the Atlantic Ocean is stated as 1·020, that of the Dea Sea 1·130 to 1·227.

|| This solid matter, according to Dr. Gale (Silliman's Journal, ser. 2. vol. xvii. p. 129), has the following composition:—

Chloride of sodium	20·196
Sulphate of soda	1·834
Chloride of magnesium	0·252
Chloride of calcium	trace

22·282

¶ For analyses of several of these brines, see Dana's 'System of Mineralogy,' p. 113.

1st of August, I found eight of them partly filled with water, in six of which the *Artemiæ* were found in abundance, though more numerous in one than in any of the others. In one tub, in which the water had a decidedly milky appearance, they were so abundant that hundreds could be obtained in a few minutes. The water in some of the other tubs containing them was of a reddish or brownish hue, or about the colour of weak tea. In two no *Artemiæ* could be seen; and in these the water appeared to have been more recently renewed. Search was made in the pools from which the water had been taken; but no *Artemiæ* were found, though doubtless from these places the progenitors of those inhabiting the tubs must have been taken. It is probable that in the pools they exist in very small numbers, being kept in check partly by various small fishes and other enemies, and partly by the unfavourable character of the water; while in the tubs the density of the water is more favourable for their rapid increase, and unfavourable or fatal to their enemies*. The water from the tubs, when examined with a high power of the microscope, was found to be filled with immense numbers of Infusoria of various kinds, such as Monads, Vibrios, and Bacteria, most of which were so small as to be distinguishable only as moving points with a $\frac{1}{2}$ -inch objective.

In the salterns of France the *Artemiæ* are associated with immense numbers of a monad, usually bright red in colour, which has been named *Monas Dunalii* by Joly, who attributes to it the red colour which the brine assumes just before crystallization†, as also the red colour observed in the *Artemiæ*, which doubtless feed upon it as well as upon various other living Infusoria and dead animal and vegetable matter of various kinds‡. The *Monas Dunalii* appears in abundance in the water having the density most favourable for *Artemia*, but increases in far greater proportion in the still denser, nearly or quite saturated brine in which *Artemia* does not live. The observations of Payen and Joly show that the *A. salina* of France can exist in waters varying in density from 4° to 20° Baumé, but that they flourish best in those that have a density of 10° to 15° §. According to Rackett, those of Lymington

* The density of the water in two of the tubs containing most *Artemiæ* was 1·065, equivalent to a brine containing 9·07 per cent. of salt. One of those tested was brownish, the other milky.

† "Recherches sur la Coloration en Rouge des Marais Salans Méditerranéens," par M. Joly (Ann. d. Sci. Nat. 1840, ser. 2. t. xiii. p. 266).

‡ According to M. Joly (*op. cit.* p. 262), a beetle, *Hydroporus salinus*, Joly, also inhabits the salterns where the water has a density of 6° or 7° Baumé, and preys upon the *Artemiæ*.

§ 4° to 20° Baumé is equivalent to a density of about 1·02 to 1·16:

do not live in the water which is undergoing the first stage of concentration, but only in the pans of concentrated brine containing about "a quarter of a pound of salt to the pint."

Our *A. gracilis* can exist without apparent inconvenience when the water in which they occur is diluted with an equal bulk of fresh water, as well as when it is much concentrated by evaporation. The water in which they were found varies in density from 1.060 to 1.065.

The genus is characterized by having eleven pairs of four-jointed branchial "feet" or fins along the sides of the body, the middle ones being the longest. Each joint of the "feet" bears flat branchial appendages, ciliated with sharp setæ, as in the other genera of the family. The abdomen is slender, six-jointed, the last joint long, terminated by two small projecting appendages, each bearing from six to ten plumose setæ. The first abdominal segment bears the external sexual organs of the male, and a short dilated ovigerous pouch in the female. In the male the head bears in front a pair of large three-jointed hooks or clasping-organs, each of which has on the inner side of its basal joint a small rounded appendage—a pair of slender antennæ just behind these, terminated by two or three minute setæ—a pair of pedunculated compound eyes—and a dark spot on the middle of the head, which is the remains of the single eye of the young. The mouth below is provided with a broad labrum, a pair of mandibles, two pairs of jaws, and a pair of lateral papillæ. In the female the head lacks the stout claspers, which are replaced by a pair of comparatively small, simple, horn-shaped organs.

Artemia gracilis, Verrill, sp. nov.

Body slender, in the male about .3 inch long, in the female .4. Claspers of the male relatively long and powerful; first joint thickened, with a distinct angle at the articulation on the outside, and a short, rounded, nearly semicircular process on the inside near the base, about its own diameter from the base; second joint broad, flattened, continuous with the third joint, strongly curved, outline nearly regularly convex on the outside, until near the middle it suddenly bends inward, forming an obtuse angle, beyond which the outline is concave to the last articulation, where it becomes again convex, forming on the last joint a slight rounded angle; the inner edge is nearly straight or but slightly concave to the last articulation, where

10° to 15° = 1.075 to 1.117. A brine having a density of 1.020, which is nearly that of sea-water, contains about 2.766 per cent. of salt; one of 1.160 contains 21.219 per cent.; one of 1.075 about 10.279 per cent.; 1.117 about 15.794 per cent.

there is a slight but distinct angle; last joint triangular, longer than broad, tapering to the acute, slightly excurved point. Antennæ slender, elongated, reaching beyond the first articulation of the claspers; terminal setæ minute. Abdomen slender, smooth; the terminal lobes small, longer than broad, broadly rounded at the end, slightly constricted at the base inside, each bearing usually seven or nine plumose setæ, the central ones much the longest. Ovipigerous pouch of the female, when seen from below, flask-shaped, the neck extending backward and downward, short, thick, subcylindrical towards the end, the body of the "flask" short, thick, swollen laterally, broader than long, the sides terminating outwardly in a small, triangular, sharp tooth, sometimes showing a minute spine. This pouch is generally filled with numerous large brownish eggs.

Colour generally reddish, flesh-colour, or light greenish, translucent, the males usually lighter, greenish white, the intestines generally showing through as a dark reddish or greenish median line; eyes very dark brown or black; ovaries often whitish, along each side of the abdomen.

An adult male gives the following measurements:—

Distance between eyes 1·81 millim.; breadth of head ·76; length of eye-stalks ·62; length of first joint of the claspers ·91, its breadth ·72, breadth of its appendage ·18; length of second and third joints from outer edge of first articulation to the tip 2·48, greatest breadth ·86, breadth at last articulation ·72; length of last joint 1·05; length of last joint of abdomen, exclusive of appendages, 1·00, its breadth ·31; length of preceding joint ·42, its breadth ·37; length of terminal appendages ·21, breadth 0·96; length of longest setæ ·70.

Near New Haven, in tubs of water from salt marsh.

Artemia monica, Verrill, sp. nov.

Form similar to that of the preceding species, but a little larger and stouter. The largest female is 13 millim. (·51 inch) long, the abdomen being 6 millim.; and 5 millim. across the branchial feet in their natural, partly extended position. The largest male is 11·5 millim. (·45 inch) long, the abdomen being 6 millim. The claspers of the male are relatively stouter, the hook or outer two joints being much broader, more triangular, and less elongated. The inner edge of the first joint, as seen from below, is regularly convex, bearing the appendage on its most convex part and not so near the base as in *A. gracilis*, the distance being about twice the breadth of the organ, which is about as broad as long and regularly rounded. At the articulation the outer edge of the joint projects as a distinct

angle. The second and third joints together have a nearly triangular form, the breadth being about half the length; the outer edge is regularly rounded, shorter than in the preceding; it forms little more than a right angle with the front edge, which is nearly straight or a little concave, sometimes slightly convex at the last articulation, but not forming a distinct angle there; the inner edge of the hook is a little concave on the first joint, becoming convex at the last articulation, where there is a distinct but very obtuse angle. The last joint is almost regularly triangular, about as broad as long, tapering to an obtuse point, the inner edge being a little convex. The antennæ are very slender, and do not reach the first articulation of the claspers. The caudal appendages are smaller than in *A. gracilis*, and scarcely longer than broad, rounded at the end, terminated by nine or ten very slender plumose setæ. The egg-pouch of the female is broad flask-shaped, strongly convex in the middle below, the sides not forming such sharp angles as in *A. gracilis*.

The English specimens of *A. salina*, as figured by Baird, differ from both the preceding species in having longer, more curved, and sharper clasping-hooks, and the basal appendage more elongated; the egg-pouch, though badly figured, is of a very different form. The French specimens, as figured by Joly, appear like a distinct species, the egg-pouch being of a very different form, and the caudal appendages very much longer and larger than in either of our species, while Baird's figure represents them as very small; but his specimens appear to have been smaller, and may have been immature, for these species begin to breed before they are half grown. Whether the French species be distinct from the English can only be determined by additional examinations, especially of the male; for the male of the former appears not to have been figured hitherto.

BRANCHIPUS, Schäffer.

Branchipus, Schäffer, Elementa Entomologica, 1766 (type, *B. pisciformis* = (?) *B. stagnalis*, Linn. sp.).

Branchipus (pars), Lamarck, Latreille, Leach, Edwards.

Chirocephalus (pars), Dana (non Bénédict Prévost, 1803; Jurine, Thompson, Baird).

Under the name of *Branchipus* at least four generic groups have been confounded by various authors.

Branchipus should be restricted to the original species described by Schäffer and the allied species, of which *B. stagnalis* (Linn. sp.) is one, and if not identical with *B. pisciformis*, as is generally supposed, must be closely allied to it.

As thus restricted, the genus is characterized by the stout two-jointed claspers of the male, with or without a tooth near the base of the hook, the basal joint being swollen, by having a pair of simple appendages resembling antennæ between the bases of the claspers in front, by the large, thick, oval egg-pouches of the female, and, apparently, by the structure of the branchial organs. It includes *B. stagnalis*, *B. spinosus*, Edw., *B. vernalis*, Verrill, sp. nov., &c. Perhaps *B. paludosus*, Müller, also belongs here.

Branchinecta.—A group of species allied to these, but destitute of all appendages between the bases of the claspers of the male, which are more slender and simple—with a much elongated egg-pouch, having lateral lobes at the base—a more slender body, with more elongated branchial organs, the middle ones longest—and having, in general appearance, a much stronger resemblance to *Artemia*, probably constitutes another genus; but for the present we prefer to regard it as a subgenus of *Branchipus*.

For this group we propose the name *Branchinecta*. It includes two new arctic species, *B. granlandica* and *B. arctica*, and *B. ferox* (Edw., sp.) from near Odessa.

Heterobranchipus.—Dr. Lovén* has described a singular species, *B. cafer*, which appears worthy to constitute a distinct genus. It is remarkable on account of the very curious claspers of the male, which are very long, three-jointed, flexuous, the basal joint bearing a long cirrus externally and a lacerate tooth on the inner side of the base, the outer joint bifid, the internal part cirriform, the external one deeply bilobed. External male organs very long, slender, curved, outer portion serrate on the outer edge, with short setæ on the inner edge; egg-pouches long, slender, slightly enlarged and beaked at the end; branchiæ of a peculiar structure; front of head between the claspers with a short bimucronate rostrum.

H. cafer is from the marshes of Natal, South Africa.

Chirocephalus, Prévost, 1803.—This genus, established for *C. diaphanus*, is evidently very distinct from all the preceding. The typical species is large, stout, and remarkable for the singular appendages between the claspers of the male, on the front of the head. These consist of two long, ligulate, fleshy processes, serrated on each side, which coil in a spiral beneath the head, but when extended, as in copulation, reach beyond the claspers; attached to the outer side of each of these are four long processes strongly serrate on the inner edge, and near the base another large, broad, thin, subtriangular appen-

* Kongl. Vet. Akad. Handl. 1846, p. 433, tab. 5.

dage, its edges strongly serrate, especially in front, capable of folding up like a fan when not in use. The claspers have a much swollen basal joint, a strongly serrate tooth on the inside of the base of the second joint, which beyond this is slender and regularly curved. Egg-pouch long-oval, large and thick; caudal appendages large; male organs and branchiæ peculiar.

C. diaphanus, Prév., inhabits freshwater pools in France, Switzerland, and England. It is well described and figured in Baird's 'British Entomostraca,' p. 39, tab. 3 & 4.

Branchipus vernalis, Verrill, sp. nov.

Form rather stout, large; the full-grown females are 23 millim. (.91 inch) long, the abdomen being 14 millims.; and 6.5 millims. wide across the branchial organs in their natural position; breadth of head across the eyes 4 millims. A large male is 22 millims. (.87 inch) long, the body 12 millims.; the breadth of head across eyes 5 millims.; the entire length of claspers 8 millims. The claspers are very large and strong, the basal joint much swollen, with a soft integument, capable of retracting the basal portion of the second joint into itself by involution of its outer edge; the second joint is elongated, broad and stout at base, with an angle on the outside, from which it rapidly narrows by strongly concave outlines on each edge, but most on the outside; at the constricted portion, not far from the base, it bears a large, strong, very prominent, crooked, bluntly pointed tooth, which is directed inward and backward, not serrate on its outer side; beyond the tooth the rest of the joint is long and rather slender, curved outward and forward at base, having just beyond the tooth on the inside a distinct but very obtuse rounded angle, from which the outline slightly curves inward to near the tip, which is a little dilated and recurved. The basal portion, including the tooth, is retracted into the first joint in some specimens. On the front of the head, between the basal joints of the claspers, are two flat, short, lanceolate, ligulate, fleshy processes, with finely serrate edges, usually coiled down, but, when extended, scarcely more than half as long as the basal joint of the claspers. Antennæ small and very slender, tapering, reaching a little beyond the eyes. Caudal appendages long, rather narrow, slightly swollen at base, gradually tapering to the acute tips, and bearing along the sides, except at base, very numerous long plumose setæ. Egg-pouches short, broad-oval, nearly as wide as long, slightly three-lobed posteriorly, the central lobe largest, sides extended and largely adherent to the sides of the abdomen; length 4 millims., width

3·5. Body flesh-colour or pale red, the intestine darker red or greenish.

A large male gives the following measurements:—

Length of first joint of claspers 4·62 millims., diameter 2·40; length of second joint 4·14, breadth at base 1·90, at tooth ·72, in middle ·52; length of tooth ·90, its diameter ·33; length of caudal appendages 4, breadth at base ·33, in middle ·20; length of setæ 2; length of antennæ 3.

New Haven, in stagnant pools (J. D. Dana, D. C. Eaton, A. E. Verrill); Salem, Mass., April 19, 1859 (R. H. Wheatland, C. Cook, from Essex Institute); Cambridge, Mass. (A. E. Verrill).

This species differs widely from all the described species of Europe in the character of the claspers of the male and their appendages. *B. stagnalis* has a pair of long setiform organs between the claspers, and a tooth on the outer side of their second joint; *B. spinosus* resembles our species somewhat in the frontal appendages between the claspers, but lacks the conspicuous tooth at the base of the second joint of the latter. The shape of the egg-pouch in our species is also characteristic.

This is doubtless the species referred to by Dr. Gould under the name of *Branchipus stagnalis**. Dekay† copies the diagnosis of *B. stagnalis* (?) from a foreign work, and gives a figure of *Chirocephalus diaphanus*, copied apparently from Desmarest, pl. 56, which is itself a copy.

This species appears very early in spring, often in great numbers, in quiet pools. I have never seen it later than the middle of May; yet, since the individuals seen in early spring are full-grown, it might, doubtless, be found also in autumn.

Branchipus (Branchinecta) arcticus, Verrill, sp. nov.

Branchipus paludosus, Packard, Invertebrate Fauna of Labrador, in Mem. Boston Soc. Nat. Hist. i. p. 295 (non Müller).

Form slender, body short, abdomen elongated. A full-sized male is 20 millims. (.79 inch) long, exclusive of the claspers, the abdomen being 13 millims., the breadth between the eyes 3 millims. A female, 20 millims. long, with the abdomen 12 millims., has an egg-pouch 6·2 long. Branchial "feet" slender, elongated, the middle ones longest, 4–5 millims. long when extended. Claspers of the male rather long and slender; the basal joint is but little swollen, elongated, regularly curved, with a small tooth or prominent angle at the articulation on the inside, and on the inner side a row of numerous small,

* Invertebrata of Massachusetts, p. 339.

† Natural History of New York, Zoology, Part I. Crustacea, p. 63, pl. 9. fig. 36.

distinct, sharp teeth, extending from the articulation about half way to the base, and arranged somewhat obliquely; second joint slender, regularly curved, tapering to a blunt point, the inner edge minutely serrulate. Front simply curved, with no appendages. Antennæ slender, scarcely more than half the length of the basal joint of the claspers. Labrum long and narrow; mandibles stout, strongly curved, bluntly pointed. Caudal appendages slender lanceolate, rather small, with long slender setæ. Egg-pouch much elongated, slender, subcylindrical, beaked or slightly bilobed at the end, the upper or dorsal lobe longest, its basal portion with two small, rounded, lateral lobes.

A large male gives the following measurements:—

Breadth between outer extremity of eyes 3·46 millims.; diameter of eyes ·66; length of basal joint of claspers 1·66, breadth ·71; length of second joint 1·29, breadth at its base ·46; width of mandibles at middle ·66; length of caudal appendages ·96, breadth at base ·16; length of longest setæ ·84 to 1 millim.

Colour of preserved specimens pale reddish, with dark green intestine. Labrador, at "Indian Tickle," on the north shore of Invuctoke Inlet; abundant in a pool of fresh water (Dr. A. S. Packard).

Branchipus (Branchinecta) grænländicus, Verrill, sp. nov.

A little stouter than the last; the largest male is 17 millims. long, exclusive of claspers, the abdomen being 10 millims., including caudal appendages. Claspers similar to those of *B. arcticus*, but more elongated, the basal joint less curved, and the second joint longer, less regularly curved, tapering more quickly at base and consequently more attenuated beyond the middle, and with more slender tips, which are nearly straight. The tooth on the inside of the first joint is rather more prominent, but the teeth of the row along the inside are similar. Caudal appendages stouter, tapering more rapidly. External male organs slender, curved outward, swollen at base. The largest female is not mature, and the egg-pouch contains no eggs; it is small, slender, elongated, subcylindrical, beaked at the end.

The largest male gives the following measurements:—

Breadth between eyes 3·20 millims.; length of basal joint of claspers 2·81, breadth ·95; length of second joint 2·24, its breadth at base ·76; length of caudal appendages ·86, width at base ·24; length of setæ ·76.

Greenland (Dr. Chr. Lütken). From the University Zoological Museum, Copenhagen.

Of this species I have seen but four specimens, which were

sent to Dr. A. S. Packard by Dr. Lütken, under the name of *B. palulosus*, Müller. The latter appears to be quite distinct, to judge from the figures; it is represented as having appendages between the claspers, and very slender, linear caudal appendages. In the form of the egg-pouch and the serration of the first joint of the claspers it is similar.

This species is very closely allied to *B. arcticus*; and when a larger series of specimens can be examined, it may prove to be only a local variety; but the specimens studied show differences that seem to warrant their separation.

XL.—On some British Freshwater Shells.

By J. GWYN JEFFREYS, F.R.S.

I LATELY received from Mr. Thomas Rogers, an active and enthusiastic naturalist at Manchester, specimens of a small *Planorbis*, for my opinion. He discovered them in the Bolton Canal. They proved to belong to a species new to Europe, viz. the *P. dilatatus* of Gould (*P. lens*, Lea), which was originally found near Cincinnati, and inhabits an extensive tract of the United States. The shell is about the same size as *P. nautilus*, which may be considered its nearest ally; but it has one whorl less, the periphery is angulated, the underside is remarkably gibbous, the mouth is very large, squarish, and scarcely oblique, the outer lip is expanded ("so as to make it trumpet-shaped," Gould), and the umbilicus is abruptly contracted, small, and deep. Some of the Manchester specimens are more or less distinctly, though microscopically, striated in the direction of the spire. The following is a description of the animal or soft parts:—

Body dark grey, often with a slight orange tint, closely and minutely speckled with flake-white: *mantle* thick, lining the mouth of the shell: *head* large and tumid: *mouth* furnished with broad lobular lips: *tentacles* cylindrical and extensile, widely diverging, broad and triangular at the base; the sheath or outer part is gelatinous, and the core or inner part is of a much darker colour and apparently greater consistence; tips rounded: *eyes* sessile, on the inner base of the tentacles: *foot* oblong, squarish in front, and bluntly pointed behind: *verge* curved, on the left-hand or umbilical side of the shell. The spawn is arranged in an irregular mass containing about a dozen membranous capsules, each of which has a yellowish yolk or vitellus in the centre.

It is active, and occasionally creeps, like many other aquatic